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SAF-RC-031
100-F Burial Grounds Remaining Sites - Soil Quick Turn
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (3) H9-02 mjp 2-7-06
INITIAL/DATE

SDG K0080 **SAF-RC-031**

Waste Site: 100-F-38 AND 128-F-2

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Date: 12 January 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100F Area Burial Grounds Remaining Sites – Soil –Waste Sites 100-F-38 & 128-F-2
Subject: Semivolatile - Data Package No. K0080

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0080 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J10FT0	11/2/05	Soil	C	See note 1 & 2
J10FT1	11/2/05	Soil	C	See note 1 & 2
J10FT2	11/2/05	Soil	C	See note 1 & 2

1 – Semivolatiles by 8270C.
2 – Waste site 100-F-38.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and Sampling and Analysis Plan for the 100 Area Remaining Sites (DOE/RL-99-58, Rev. 0, September 2000). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two

times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

Due to method blank contamination, the di-n-butylphthalate results in all samples were qualified as undetected, raised to the RQL and flagged "U".

Due to method blank contamination, the bis(2-ethylhexyl)phthalate results in all samples were qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J".

Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to an LCS recovery outside QC limits (49%), all 4-nitroanaline results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (38%), all carbazole results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to an RPD outside QC limits, all bis(2-chloroethyl)ether (53%), 2,4-dinitrophenol (62%) and 3,3-dichlorobenzidine (42%) results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All undetected analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. K0080 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the di-n-butylphthalate results in all samples were qualified as undetected, raised to the RQL and flagged "U".
- Due to method blank contamination, the bis(2-ethylhexyl)phthalate results in all samples were qualified as undetected and flagged "U".
- Due to an LCS recovery outside QC limits (49%), all 4-nitroanaline results were qualified as estimates and flagged "J".

- Due to an LCS recovery outside QC limits (38%), all carbazole results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits, all bis(2-chloroethyl)ether (53%), 2,4-dinitrophenol (62%) and 3,3-dichlorobenzidine (42%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All undetected analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K00304	REVIEWER: TE	Project: 100-F-38	PAGE: 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Di-n-butylphthalate	U at RQL	All	Blank contamination
Bis(2-ethylhexyl)phthalate	U	All	Blank contamination
4-nitroanaline Carbozole	J	All	LCS recovery
Bis(2-choroethyl)ether 2,4-dinitrophenol 3,3-dichlorobenzidine	J	ALL	RPD

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG) Page__1__ of__1__

Project: WASHINGTON CLOSURE HANFORD																	
Laboratory: LLI SDG: K0080																	
Sample Number		J10FT0		J10FT1		J10FT2				Sample Number		J10FT0		J10FT1		J10FT2	
Waste Site		100-F-38		100-F-38		100-F-38				Waste Site		100-F-38		100-F-38		100-F-38	
Remarks										Remarks							
Sample Date		11/2/05		11/2/05		11/2/05				Sample Date		11/2/05		11/2/05		11/2/05	
Extraction Date		11/7/05		11/7/05		11/7/05				Extraction Date		11/7/05		11/7/05		11/7/05	
Analysis Date		11/9/05		11/9/05		11/10/05				Analysis Date		11/9/05		11/9/05		11/10/05	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q
Phenol	300	350	U	350	U	340	U			Acenaphthene	300	350	U	350	U	350	U
bis(2-Chloroethyl)ether	300	350	UJ	350	UJ	340	UJ			2,4-Dinitrophenol	300	880	UJ	880	UJ	840	UJ
2-Chlorophenol	300	350	U	350	U	340	U			4-Nitrophenol	300	880	U	880	U	840	U
1,3-Dichlorobenzene	300	350	U	350	U	340	U			Dibenzofuran	300	350	U	350	U	340	U
1,4-Dichlorobenzene	300	350	U	350	U	340	U			2,4-Dinitrotoluene	300	350	U	350	U	340	U
1,2-Dichlorobenzene	300	350	U	350	U	340	U			Diethylphthalate	300	350	U	350	U	340	U
2-Methylphenol	300	350	U	350	U	340	U			4-Chlorophenyl-phenyl ether	300	350	U	350	U	340	U
2,2'-oxybis(1-chloropropane)	300	350	U	350	U	340	U			Fluorene	300	350	U	350	U	340	U
4-Methylphenol	300	350	U	350	U	340	U			4-Nitroaniline	300	880	UJ	880	UJ	840	UJ
N-Nitroso-di-n-propylamine	300	350	U	350	U	340	U			4,6-Dinitro-2-methylphenol	300	880	U	880	U	840	U
Hexachloroethane	300	350	U	350	U	340	U			N-Nitrosodiphenylamine	300	350	U	350	U	340	U
Nitrobenzene	300	350	U	350	U	340	U			4-Bromophenyl-phenyl ether	300	350	U	350	U	340	U
Isophorone	300	350	U	350	U	340	U			Hexachlorobenzene	300	350	U	350	U	340	U
2-Nitrophenol	300	350	U	350	U	340	U			Pentachlorophenol	300	880	U	880	U	840	U
2,4-Dimethylphenol	300	350	U	350	U	340	U			Phenanthrene	300	350	U	350	U	340	U
bis(2-Chloroethoxy)methane	300	350	U	350	U	340	U			Anthracene	300	350	U	350	U	340	U
2,4-Dichlorophenol	300	350	U	350	U	340	U			Carbazole	300	350	UJ	350	UJ	340	UJ
1,2,4-Trichlorobenzene	300	350	U	350	U	340	U			Di-n-butylphthalate	300	300	U	300	U	300	U
Naphthalene	300	350	U	350	U	340	U			Fluoranthene	300	350	U	350	U	340	U
4-Chloroaniline	300	350	U	350	U	340	U			Pyrene	300	350	U	350	U	340	U
Hexachlorobutadiene	300	350	U	350	U	340	U			Butylbenzylphthalate	300	350	U	350	U	340	U
4-Chloro-3-methylphenol	300	350	U	350	U	340	U			3,3'-Dichlorobenzidine	300	350	UJ	350	UJ	340	UJ
2-Methylnaphthalene	300	350	U	350	U	340	U			Benzo(a)anthracene	300	350	U	350	U	340	U
Hexachlorocyclopentadiene	300	350	U	350	U	340	U			Chrysene	300	350	U	350	U	340	U
2,4,6-Trichlorophenol	300	350	U	350	U	340	U			bis(2-Ethylhexyl)phthalate	300	510	U	450	U	400	U
2,4,5-Trichlorophenol	300	880	U	880	U	840	U			Di-n-octylphthalate	300	350	U	350	U	340	U
2-Chloronaphthalene	300	350	U	350	U	340	U			Benzo(b)fluoranthene	300	350	U	350	U	340	U
2-Nitroaniline	300	880	U	880	U	840	U			Benzo(k)fluoranthene	300	350	U	350	U	340	U
Dimethylphthalate	300	350	U	350	U	340	U			Benzo(a)pyrene	300	350	U	350	U	340	U
Acenaphthylene	300	350	U	350	U	340	U			Indeno(1,2,3-cd)pyrene	300	350	U	350	U	340	U
2,6-Dinitrotoluene	300	350	U	350	U	340	U			Dibenz(a,h)anthracene	300	350	U	350	U	340	U
3-Nitroaniline	300	880	U	880	U	840	U			Benzo(g,h,i)perylene	300	350	U	350	U	340	U

0000111

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

Semivolatiles by GC/MS, HSL List Report Date: 11/11/05 16:54

RFW Batch Number: 0511L633 Client: TNUHANFORD RC-031 K0080 Work Order: 11343606001 Page: 1a

	Cust ID:	J10FT0	J10FT0	J10FT0	J10FT1	J10FT2	SBLKQA
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	05LE0870-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
	Nitrobenzene-d5	88 %	74 %	89 %	65 %	64 %	62 %
Surrogate	2-Fluorobiphenyl	94 %	74 %	80 %	67 %	68 %	60 %
Recovery	Terphenyl-d14	97 %	81 %	88 %	80 %	78 %	78 %
	Phenol-d5	90 %	74 %	85 %	67 %	68 %	67 %
	2-Fluorophenol	74 %	62 %	79 %	60 %	58 %	62 %
	2,4,6-Tribromophenol	95 %	85 %	93 %	69 %	74 %	71 %
		fl	fl	fl	fl	fl	fl
Phenol		350 U	77 %	93 %	350 U	340 U	330 U
bis(2-Chloroethyl)ether		350 U J	72 %	124 %	350 U J	340 U J	330 U
2-Chlorophenol		350 U	69 %	89 %	350 U	340 U	330 U
1,3-Dichlorobenzene		350 U	64 %	85 %	350 U	340 U	330 U
1,4-Dichlorobenzene		350 U	61 %	79 %	350 U	340 U	330 U
1,2-Dichlorobenzene		350 U	66 %	85 %	350 U	340 U	330 U
2-Methylphenol		350 U	79 %	92 %	350 U	340 U	330 U
2,2'-oxybis(1-Chloropropane)		350 U	73 %	93 %	350 U	340 U	330 U
4-Methylphenol		350 U	81 %	94 %	350 U	340 U	330 U
N-Nitroso-di-n-propylamine		350 U	81 %	100 %	350 U	340 U	330 U
Hexachloroethane		350 U	59 %	80 %	350 U	340 U	330 U
Nitrobenzene		350 U	74 %	95 %	350 U	340 U	330 U
Isophorone		350 U	82 %	102 %	350 U	340 U	330 U
2-Nitrophenol		350 U	75 %	93 %	350 U	340 U	330 U
2,4-Dimethylphenol		350 U	77 %	85 %	350 U	340 U	330 U
bis(2-Chloroethoxy)methane		350 U	73 %	91 %	350 U	340 U	330 U
2,4-Dichlorophenol		350 U	76 %	88 %	350 U	340 U	330 U
1,2,4-Trichlorobenzene		350 U	65 %	83 %	350 U	340 U	330 U
Naphthalene		350 U	69 %	85 %	350 U	340 U	330 U
4-Chloroaniline		350 U	107 %	129 * %	350 U	340 U	330 U
Hexachlorobutadiene		350 U	68 %	86 %	350 U	340 U	330 U
4-Chloro-3-methylphenol		350 U	85 %	97 %	350 U	340 U	330 U
2-Methylnaphthalene		350 U	75 %	89 %	350 U	340 U	330 U
Hexachlorocyclopentadiene		350 U	44 %	58 %	350 U	340 U	330 U
2,4,6-Trichlorophenol		350 U	71 %	81 %	350 U	340 U	330 U
2,4,5-Trichlorophenol		880 U	80 %	93 %	880 U	840 U	830 U

*= Outside of EPA CLP QC limits.

1/12/06

Cust ID:	J10FT0	J10FT0	J10FT0	J10FT1	J10FT2	SBLKQA
RFW#:	001	001 MS	001 MSD	002	003	05LE0870-MB1
2-Chloronaphthalene	350 U	73 %	85 %	350 U	340 U	330 U
2-Nitroaniline	880 U	94 %	109 %	880 U	840 U	830 U
Dimethylphthalate	350 U	78 %	89 %	350 U	340 U	330 U
Acenaphthylene	350 U	74 %	90 %	350 U	340 U	330 U
2,6-Dinitrotoluene	350 U	86 %	101 %	350 U	340 U	330 U
3-Nitroaniline	880 U	109 %	133 %	880 U	840 U	830 U
Acenaphthene	350 U	73 %	87 %	350 U	340 U	330 U
2,4-Dinitrophenol	880 UJ	34 %	65 %	880 UJ	840 UJ	830 U
4-Nitrophenol	880 U	95 %	110 %	880 U	840 U	830 U
Dibenzofuran	350 U	77 %	90 %	350 U	340 U	330 U
2,4-Dinitrotoluene	350 U	91 %	108 %	350 U	340 U	330 U
Diethylphthalate	350 U	78 %	90 %	350 U	340 U	330 U
4-Chlorophenyl-phenylether	350 U	71 %	83 %	350 U	340 U	330 U
Fluorene	350 U	77 %	90 %	350 U	340 U	330 U
4-Nitroaniline	880 UJ	95 %	123 * %	880 UJ	840 UJ	830 U
4,6-Dinitro-2-methylphenol	880 U	75 %	92 %	880 U	840 U	830 U
N-Nitrosodiphenylamine (1)	350 U	66 %	78 %	350 U	340 U	330 U
4-Bromophenyl-phenylether	350 U	70 %	82 %	350 U	340 U	330 U
Hexachlorobenzene	350 U	77 %	90 %	350 U	340 U	330 U
Pentachlorophenol	880 U	98 %	115 %	880 U	840 U	830 U
Phenanthrene	350 U	74 %	87 %	350 U	340 U	330 U
Anthracene	350 U	82 %	95 %	350 U	340 U	330 U
Carbazole	350 UJ	93 %	109 %	350 UJ	340 UJ	330 U
Di-n-butylphthalate	300 ~~47~~ 1/12 JB U	82 %	93 %	300 ~~36~~ 1/14 JB U	300 ~~29~~ 1/24 JB U	22 J
Fluoranthene	350 U	84 %	96 %	350 U	340 U	330 U
Pyrene	350 U	77 %	89 %	350 U	340 U	330 U
Butylbenzylphthalate	350 U	77 %	94 %	350 U	340 U	330 U
3,3'-Dichlorobenzidine	350 UJ	65 %	100 %	350 UJ	340 UJ	330 U
Benzo(a)anthracene	350 U	79 %	91 %	350 U	340 U	330 U
Chrysene	350 U	78 %	90 %	350 U	340 U	330 U
bis(2-Ethylhexyl)phthalate	510 ~~B~~ 1/24 U	71 %	88 %	450 ~~B~~ 1/14 U	400 ~~B~~ 1/24 U	250 J
Di-n-octyl phthalate	350 1/24 U	90 %	109 %	350 U	340 U	330 U
Benzo(b)fluoranthene	350 U	77 %	98 %	350 U	340 U	330 U
Benzo(k)fluoranthene	350 U	87 %	102 %	350 U	340 U	330 U
Benzo(a)pyrene	350 U	78 %	91 %	350 U	340 U	330 U
Indeno(1,2,3-cd)pyrene	350 U	60 %	74 %	350 U	340 U	330 U
Dibenz(a,h)anthracene	350 U	62 %	77 %	350 U	340 U	330 U
Benzo(g,h,i)perylene	350 U	52 %	66 %	350 U	340 U	330 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

R 1/12/06

0000013

		Cust ID:	SBLKQA BS		SBLKQA BSD	
Sample Information		RFW#:	05LE0870-MB1		05LE0870-MB1	
		Matrix:	SOIL		SOIL	
		D.F.:	1.00		1.00	
		Units:	ug/Kg		ug/Kg	
	Nitrobenzene-d5		70	%	71	%
Surrogate Recovery	2-Fluorobiphenyl		75	%	76	%
	Terphenyl-d14		72	%	81	%
	Phenol-d5		77	%	77	%
	2-Fluorophenol		74	%	74	%
	2,4,6-Tribromophenol		85	%	96	%
Phenol			80	%	82	%
bis(2-Chloroethyl)ether			78	%	81	%
2-Chlorophenol			79	%	83	%
1,3-Dichlorobenzene			76	%	76	%
1,4-Dichlorobenzene			73	%	75	%
1,2-Dichlorobenzene			78	%	80	%
2-Methylphenol			78	%	81	%
2,2'-oxybis(1-Chloropropane)			78	%	81	%
4-Methylphenol			79	%	83	%
N-Nitroso-di-n-propylamine			82	%	85	%
Hexachloroethane			73	%	75	%
Nitrobenzene			70	%	73	%
Isophorone			83	%	85	%
2-Nitrophenol			74	%	80	%
2,4-Dimethylphenol			65	%	66	%
bis(2-Chloroethoxy)methane			73	%	75	%
2,4-Dichlorophenol			73	%	75	%
1,2,4-Trichlorobenzene			70	%	71	%
Naphthalene			70	%	73	%
4-Chloroaniline			89	%	92	%
Hexachlorobutadiene			76	%	76	%
4-Chloro-3-methylphenol			76	%	82	%
2-Methylnaphthalene			78	%	81	%
Hexachlorocyclopentadiene			61	%	57	%
2,4,6-Trichlorophenol			80	%	82	%
2,4,5-Trichlorophenol			83	%	92	%

*= Outside of EPA CLP QC limits.

40014

11/12/06

Cust ID:	SBLKQA BS		SBLKQA BSD	
RFW#:	05LE0870-MB1		05LE0870-MB1	
2-Chloronaphthalene	78	%	81	%
2-Nitroaniline	85	%	89	%
Dimethylphthalate	85	%	91	%
Acenaphthylene	80	%	81	%
2,6-Dinitrotoluene	87	%	95	%
3-Nitroaniline	88	%	98	%
Acenaphthene	83	%	84	%
2,4-Dinitrophenol	37	%	70	%
4-Nitrophenol	80	%	85	%
Dibenzofuran	82	%	86	%
2,4-Dinitrotoluene	94	%	104	%
Diethylphthalate	83	%	92	%
4-Chlorophenyl-phenylether	82	%	84	%
Fluorene	82	%	88	%
4-Nitroaniline	49 *	%	53	%
4,6-Dinitro-2-methylphenol	92	%	138	%
N-Nitrosodiphenylamine (1)	70	%	80	%
4-Bromophenyl-phenylether	77	%	88	%
Hexachlorobenzene	89	%	100	%
Pentachlorophenol	88	%	122	%
Phenanthrene	85	%	94	%
Anthracene	90	%	100	%
Carbazole	38 *	%	47 *	%
Di-n-butylphthalate	98	%	112	%
Fluoranthene	94	%	109	%
Pyrene	75	%	85	%
Butylbenzylphthalate	91	%	104	%
3,3'-Dichlorobenzidine	81	%	83	%
Benzo(a)anthracene	84	%	95	%
Chrysene	83	%	94	%
bis(2-Ethylhexyl)phthalate	98	%	110	%
Di-n-octyl phthalate	97	%	120	%
Benzo(b)fluoranthene	82	%	99	%
Benzo(k)fluoranthene	84	%	92	%
Benzo(a)pyrene	81	%	89	%
Indeno(1,2,3-cd)pyrene	79	%	82	%
Dibenz(a,h)anthracene	79	%	82	%
Benzo(g,h,i)perylene	79	%	80	%

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1/12/06

000015

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-031
LVL #: 0511L633
SDG/SAF # K0080/RC-031

W.O. #: 11343-606-001-9999-00
Date Received: 11-04-2005

SEMIVOLATILE

Three (3) soil samples were collected on 11-02-2005.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 11-07-2005 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 11-08,09,10-2005.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. Two (2) of one hundred twenty-eight (128) matrix spike recoveries were outside acceptance criteria.

   Three (3) of one hundred twenty-eight (128) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. The method blank contained the common laboratory contaminants Bis (2-Ethylhexyl) phthalate and Di-n-butylphthalate at levels less than the CRQL.
7. Internal standard area and retention time criteria were met.
8. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
9. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
10. I certify, that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data, contained in this hard-copy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

11/14/05
Date

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 05MS345

Initiator: Shawn Saylor
Date: 11-10-05
Client: TMM

Batch: 05NL633
Samples: 85+850
Method: SW846/MCAWW/CLP/

Parameter: 8270
Matrix: SOLID
Prep Batch: 05LE0870

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

low recovery of several analytes in the blank spike + blankspikedup but matrix spike + matrix spike dup are ok

2. Known or Probable Causes(s)

loss during extraction

3. Discussion and Proposed Action Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

narrate

4. Project Manager Instructions...signature/date: 11/14/05

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 11/14/05 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
(1)	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
	X Project Mgr: Stone/Johnson		__ GC/LC: Kiger
__	__ Data Management: Stilwell	(2)	X MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-031-008	Page 1 of 1
Collector COFFMAN	Company Contact R T Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH	Price Code Air Quality ☐	Data Turnaround 15 DA
Project Designation 100-F Burial Grounds Remaining Sites - Soil Quick Turn	Sampling Location 100 F / 100-F-38		SAF No. RC-031		
Ice Chest No. ERC-01-040	Field Logbook No. EFL-1174	COA R126F22000	Method of Shipment FED X		
Shipped To EBERLINE SERVICES/ LIONVILLE	Offsite Property No. A060104		Bill of Lading/Air Bill No. See OSC		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 deg. C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	P				
No. of Container(s)	1	1	1	1	1	1				
Volume	60mL	60mL	60mL	60mL	60mL	1000mL				
SAMPLE ANALYSIS	See Item (1) in Special Instructions	ICP Metals - 6010A (Add-on) (Antimony, Beryllium, Nickel, Thallium)	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See Item (2) in Special Instructions PAS 11/3/05				
Sample No. / Matrix * / Sample Date / Sample Time										
J10FT0 / SOIL / 11/2/05 / 1230	X	X	X	X	X	X				CENTER
J10FT1 / SOIL / 11/2/05 / 1245	X	X	X	X	X	X				SOUTH
J10FT2 / SOIL / 11/2/05 / 1300	X	X	X	X	X	X				NORTH

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT Coffman/RT Coffman	1600 11/2/05	Refer #2A 3728	1600 11/2/05
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
3725 Ref 24	11/3/05 1000		11/3/05 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
	11/3/05 1000	Fed EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fed Ex	11-4-05 1099		11-4-05 1099
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

NA

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-235, Uranium-238)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solid
DL=Drum Liqu
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

0010019

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: ~~100-F-38~~ 100-F-38			DATA PACKAGE: K0080		
VALIDATOR: TLI		LAB:		DATE: 1/9/04	
			SDG: K0080		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J10FT0 J10FT1 J10FT2					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No (N/A)
Calibration blank results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... Yes (No) N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: di-n-butylphthalate - U at RQL only
bis(2-ethylhexyl)phthalate - U all no PBS

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... (Yes) No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... (Yes) No N/A
Surrogates traceable? (Levels D, E) ..... Yes No (N/A)
Surrogates expired? (Levels D, E) ..... Yes No (N/A)
MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... Yes (No) N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: LCS 4-nitroaniline + carbazole - J
no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD RPD values acceptable? ..... Yes (No) N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
Field duplicate RPD values acceptable? ..... Yes No (N/A)
Field split RPD values acceptable? ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: bis(2-chloroethyl)ether, 2,4 dinitrophenol, 3,3 dichlorobenzidine } RPD J all

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No (N/A)
Iinternal standard areas acceptable? ..... Yes No (N/A)
Internal standard retention times acceptable? ..... Yes No (N/A)
Standards traceable? ..... Yes No (N/A)
Standards expired? ..... Yes No (N/A)
Transcription/calculation errors? ..... Yes No (N/A)

Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A
Sample holding times acceptable? ..... (Yes) No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No (N/A)
Compound quantitation acceptable? (Levels D, E) ..... Yes No (N/A)
Results reported for all requested analyses? ..... (Yes) No N/A
Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)
Samples properly prepared? (Levels D, E) ..... Yes No (N/A)
Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No (N/A)
Detection limits meet RDL? ..... Yes (No) N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: all updates ave

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A
GPC check performed? ..... Yes No N/A
GPC check recoveries acceptable? ..... Yes No N/A
GPC calibration performed? ..... Yes No N/A
GPC calibration check performed? ..... Yes No N/A
GPC calibration check retention times acceptable? ..... Yes No N/A
Check/calibration materials traceable? ..... Yes No N/A
Check/calibration materials Expired? ..... Yes No N/A
Analytical batch QC given similar cleanup? ..... Yes No N/A
Transcription/Calculation Errors? ..... Yes No N/A
Comments:

Date: 12 January 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100F Area Burial Grounds Remaining Sites – Soil – Waste Sites 100-F-38 & 128-F-2
Subject: PCB - Data Package No. K0080

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0080 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J10FT0	11/2/05	Soil	C	See note 1 & 2
J10FT1	11/2/05	Soil	C	See note 1 & 2
J10FT2	11/2/05	Soil	C	See note 1 & 2

1 – PCBs by 8082.
2 – Waste site 100-F-38.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and Sampling and Analysis Plan for the 100 Area Remaining Sites (DOE/RL-99-58, Rev. 0, September 2000). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all

associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows

have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Remaining Waste Sites RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data Package No. K0080 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-99-58, Rev. 0, *Sampling and Analysis Plan for the 100 Area Remaining Sites*, September 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

SDG: K0080	REVIEWER: TLI	PROJECT: 100-F-38	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PESTICIDE/PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD							
Laboratory: LLI	SDG: K0080						
Sample Number		J10FT0		J10FT1		J10FT2	
Waste Site		100-F-38		100-F-38		100-F-38	
Remarks							
Sample Date		11/2/05		11/2/05		11/2/05	
Extraction Date		11/8/05		11/8/05		11/8/05	
Analysis Date		11/10/05		11/10/05		11/10/05	
PCB	RQL	Result	Q	Result	Q	Result	Q
Aroclor-1016	100	14	U	14	U	14	U
Aroclor-1221	100	14	U	14	U	14	U
Aroclor-1232	100	14	U	14	U	14	U
Aroclor-1242	100	14	U	14	U	14	U
Aroclor-1248	100	14	U	14	U	14	U
Aroclor-1254	100	14	U	14	U	14	U
Aroclor-1260	100	15		14	U	32	

000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 11/17/05 13:39

RFW Batch Number: 0511L633 Client: TNUHANFORD RC-031 K0080 Work Order: 11343606001 Page: 1

	Cust ID:	J10FT0	J10FT1	J10FT2	J10FT2	J10FT2	PBLKVW
Sample Information	RFW#:	001	002	003	003 MS	003 MSD	05LE0875-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		39 %	68 %	62 %	58 %	62 %	58 %
Decachlorobiphenyl		42 %	70 %	69 %	64 %	60 %	64 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		14 U	14 U	14 U	86 %	91 %	13 U
Aroclor-1221		14 U	14 U	14 U	14 U	14 U	13 U
Aroclor-1232		14 U	14 U	14 U	14 U	14 U	13 U
Aroclor-1242		14 U	14 U	14 U	14 U	14 U	13 U
Aroclor-1248		14 U	14 U	14 U	14 U	14 U	13 U
Aroclor-1254		14 U	14 U	14 U	14 U	14 U	13 U
Aroclor-1260		15	14 U	32	102 %	98 %	13 U

	Cust ID:	PBLKVW BS
Sample Information	RFW#:	05LE0875-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	UG/KG
Surrogate: Tetrachloro-m-xylene		65 %
Decachlorobiphenyl		69 %
		fl
Aroclor-1016		111 %
Aroclor-1221		13 U
Aroclor-1232		13 U
Aroclor-1242		13 U
Aroclor-1248		13 U
Aroclor-1254		13 U
Aroclor-1260		110 %

1/12/06

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

11/17/

0000004

0000011

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-031
LVL #: 0511L633
SDG/SAF # K0080/RC-031

W.O. #: 11343-606-001-9999-00
Date Received: 11-04-2005

PCB

Three (3) soil samples were collected on 11-02-2005.

The samples and their associated QC samples were extracted on 11-08-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 11-09,10,11-2005. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/8/05
Date

som\r:\group\data\pest\tnu hanford\0511-633.pcbs
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-031-008	Page 1 of 1

Collector: COFFMAN	Company Contact: R T Coffman / Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround: Air Quality ☐ 15 DAY
Project Designation: 100-F Burial Grounds Remaining Sites - Soil Quick Turn	Sampling Location: 100 F / 100-P-38	SAF No.: RC-031	
Ice Chest No.: ERL-01-040	Field Logbook No.: EFL-1174 / COA: R126F22000	Method of Shipment: FED X	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: AD60104	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

Special Handling and/or Storage
Cool 4 deg. C

000014

SAMPLE ANALYSIS											
Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	P				
No. of Container(s)	1	1	1	1	1	1				
Volume	60mL	60mL	60mL	60mL	60mL	1000mL				
	See item (1) in Special Instructions	ICP Metals - 6010A (Add-on) (Antimony, Beryllium, Nickel, Thallium)	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions PAS 11/3/05				
Sample No.	Matrix *	Sample Date	Sample Time								
J10FT0	SOIL	11/2/05	1230	X	X	X	X	X	X		CENTER
J10FT1	SOIL	11/2/05	1245	X	X	X	X	X	X		SOUTH
J10FT2	SOIL	11/2/05	1300	X	X	X	X	X	X		NORTH

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: RT COFFMAN / RT Coffman	Date/Time: 1600 11/2/05	Received By/Stored In: REFER #2A 3728	Date/Time: 1600 11/2/05
Relinquished By/Removed From: 3725 Ref 24	Date/Time: 11/3/05 1000	Received By/Stored In: B St John	Date/Time: 11/3/05 1000
Relinquished By/Removed From: B St John	Date/Time: 11/3/05 1000	Received By/Stored In: Fed EX	Date/Time:
Relinquished By/Removed From: Fed EX	Date/Time: 11-4-05 10930	Received By/Stored In:	Date/Time: 11-4-05 10930
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS
NA

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-235, Uranium-238)

Matrix *
S=Soil
SS=Soil-wet
SQ=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquid
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 100F38 ~~1255~~ 1/9/6			DATA PACKAGE: K0080		
VALIDATOR: TCI		LAB: LLI		DATE: 1/9/06	
			SDG: K0080		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	(SW-846 8082)	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J10FT0 J10FT1 J10FT2					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

DDT and endrin breakdowns acceptable? ..... Yes No (N/A)

Comments: _____

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No (N/A)
Calibration blank results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: no PB

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... (Yes) No N/A
Surrogate recoveries acceptable? ..... (Yes) No N/A
Surrogates traceable? (Levels D, E) ..... Yes No (N/A)
Surrogates expired? (Levels D, E) ..... Yes No (N/A)
MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: no PAS

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A
Duplicate results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
Field duplicate RPD values acceptable? ..... Yes No N/A
Field split RPD values acceptable? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A
Positive results resolved acceptably? ..... Yes No N/A
Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A
Sample holding times acceptable? ..... Yes No N/A
Comments: _____

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E)	Yes	No	N/A
Compound quantitation acceptable? (Levels D, E)	Yes	No	N/A
Results reported for all requested analyses?	Yes	No	N/A
Results supported in the raw data? (Levels D, E)	Yes	No	N/A
Samples properly prepared? (Levels D, E)	Yes	No	N/A
Detection limits meet RDL?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed?	Yes	No	N/A
Lot check performed?	Yes	No	N/A
Check recoveries acceptable?	Yes	No	N/A
GPC cleanup performed?	Yes	No	N/A
GPC check performed?	Yes	No	N/A
GPC check recoveries acceptable?	Yes	No	N/A
GPC calibration performed?	Yes	No	N/A
GPC calibration check performed?	Yes	No	N/A
GPC calibration check retention times acceptable?	Yes	No	N/A
Check/calibration materials traceable?	Yes	No	N/A
Check/calibration materials Expired?	Yes	No	N/A
Analytical batch QC given similar cleanup?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments: _____

Date: 12 January 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100F Area Burial Grounds Remaining Sites – Soil – Waste Sites 100-F-38 & 128-F-2
Subject: Wet Chemistry - Data Package No. K0080

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0080 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J10FT0	11/2/05	Soil	C	See note 1 & 2
J10FT1	11/2/05	Soil	C	See note 1 & 2
J10FT2	11/2/05	Soil	C	See note 1 & 2
J10FR9	11/2/05	Soil	C	See note 1 & 3

1 – Chromium VI by 7196A.
2 – Waste site 100-F-38.
3 – Waste site 128-F-2.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work, Sampling and Analysis Plan for the 100 Area Remaining Sites (DOE/RL-99-58, Rev. 0, September 2000) and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI.

If holding times are exceeded, but not by greater than two times the limit, all

associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All other holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J".

Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package K0080 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

DOE/RL-99-58, Rev. 0, *Sampling and Analysis Plan for the 100 Area Remaining Sites*, September 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0080	REVIEWER: TLI	PROJECT: 100-F-38 128-F-2	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD									
Lab: LLI	SDG: K0080								
Sample Number		J10FT0		J10FT1		J10FT2		J10FR9	
Waste Site		100-F-38		100-F-38		100-F-38		128-F-2	
Remarks									
Sample Date		11/2/05		11/2/05		11/2/05		11/2/05	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	1.9		0.23		1.0		0.20	U

0000710

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/11/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10FT0	% Solids	94.9	%	0.01	1.0
		Chromium VI	1.9	MG/KG	0.21	1.0
-002	J10FT1	% Solids	94.8	%	0.01	1.0
		Chromium VI	0.23	MG/KG	0.21	1.0
-003	J10FT2	% Solids	94.6	%	0.01	1.0
		Chromium VI	1.0	MG/KG	0.21	1.0
-004	J10FR9	% Solids	98.6	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0

11/12/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-031 K0080
LVL#: 0511L633

W.O.#: 11343-606-001-9999-00
Date Received: 11-04-05

INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

   LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blank for Chromium VI was within the method criteria.

6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.

7. The matrix spike recovery for Soluble Chromium VI was within the 75-125% control limits however MS recovery for Insoluble Chromium VI was above the control limits at 127.1% that may be attributed to sample inhomogeneity.

8. The replicate analyses for Percent Solids and Chromium VI were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

11/15/05
Date

njp\11-633

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-031-008	Page 1 of 1
Collector: COFFMAN	Company Contact: R T Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround: 15 Day
Project Designation: 100-F Burial Grounds Remaining Sites - Soil Quick Turn	Sampling Location: 100 F / 100-F-38		SAF No.: RC-031	Air Quality ☐
Ice Chest No.: ERC-01-040	Field Logbook No.: EFL-1174	COA: R126FZ2000	Method of Shipment: FED X	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: AD60104		Bill of Lading/Air Bill No.: see DSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

Special Handling and/or Storage
Cool 4 deg. C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	P				
No. of Container(s)	1	1	1	1	1	1				
Volume	60mL	60mL	60mL	60mL	60mL	1000mL				
SAMPLE ANALYSIS	See Item (1) in Special Instructions	ICP Metals - 6010A (Add-on) (Antimony, Beryllium, Nickel, Thallium)	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions. DAS 11/3/05				
Sample No.	Matrix *	Sample Date	Sample Time							
J10FT0	SOIL	11/2/05	1230	X	X	X	X	X	X	CENTER
J10FT1	SOIL	11/2/05	1245	X	X	X	X	X	X	SOUTH
J10FT2	SOIL	11/2/05	1300	X	X	X	X	X	X	NORTH

0000014

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: RT COFFMAN / RT Coffman — Date/Time: 11/2/05 1600	Received By/Stored In: REFER #2A 3728 — Date/Time: 11/2/05 1600	
Relinquished By/Removed From: 3725 Ref 24 — Date/Time: 11/3/05 1000	Received By/Stored In: B STORE — Date/Time: 11/3/05 1000	
Relinquished By/Removed From: B STORE — Date/Time: 11/3/05 1000	Received By/Stored In: Fed EX — Date/Time:	
Relinquished By/Removed From: Fed EX — Date/Time: 11-4-05 1000	Received By/Stored In: — Date/Time: 11-4-05 1000	
Relinquished By/Removed From: — Date/Time:	Received By/Stored In: — Date/Time:	
Relinquished By/Removed From: — Date/Time:	Received By/Stored In: — Date/Time:	

SPECIAL INSTRUCTIONS
NA

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-235, Uranium-238)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquid
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-031-007	Page 1 of 1
Collector COFFMAN	Company Contact R T Coffman Telephone No. 528-6409	Project Coordinator KESSNER, JH	Price Code Data Turnaround 15 DAYS
Project Designation 100-F Burial Grounds Remaining Sites - Soil Quick Turn	Sampling Location 100 F / 126-F-2, Light sandy ash material	SAF No. RC-031	Air Quality ☐
Ice Chest No. ERC-01-040	Field Logbook No. EFL-1174 COA R126F22000	Method of Shipment FED X	
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060104	Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 deg. C

Preservation				None	None	Cool 4C	None							
Type of Container				aG	aG	aG	P							
No. of Container(s)				1	1	1	1							
Volume				60mL	60mL	60mL	1000mL							
SAMPLE ANALYSIS				See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Antimony, Beryllium, Nickel, Thallium)	Chromium Hex - 7196	See item (2) in Special Instructions. DAS 11/3/05							
Sample No.	Matrix *	Sample Date	Sample Time											
J10FR9	SOIL	11/2/05	1200	X	X	X	X							

000015

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From RT COFFMAN / RT Coffman	11/2/05 1600	Received By/Stored In KEFFER #2A, 3728	11/2/05 1600
Relinquished By/Removed From 3728 RC C2A	11/3/05 1000	Received By/Stored In D Spurlock	11/3/05 1000
Relinquished By/Removed From D Spurlock	11/3/05 1000	Received By/Stored In Fed Ex	
Relinquished By/Removed From [illegible]	11.4.05/0930	Received By/Stored In [illegible]	11.4.05/0930
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

NA

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)

(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Uranium-235, Uranium-238}

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 128F2 100F38			DATA PACKAGE: K0080		
VALIDATOR: JLF		LAB: LLI		DATE: 1/9/00	
			SDG: K0080		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J10FT0 J10FT1 J10FT2					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

_____

_____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

ICV and CCV checks performed on all instruments? ..... Yes No (N/A)

ICV and CCV checks acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

_____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No (N/A)
ICB and CCB results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: no FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... (Yes) No N/A
Spike recoveries acceptable? ..... (Yes) No N/A
Sike standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
Spike standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: no PA?

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... (Yes) No N/A
Duplicate results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
Field duplicate RPD values acceptable? ..... Yes No (N/A)
Field split RPD values acceptable? ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A
Sample holding times acceptable? ..... (Yes) No N/A
Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... (Yes) No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)

Samples properly prepared? (Levels D, E) ..... Yes No (N/A)

Detection limits meet RDL? ..... (Yes) No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes (No) N/A

Comments: _____

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Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/11/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LVI078-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/11/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-004	J10FR9	Soluble Chromium VI	3.9	0.20u	4.1	97.7	1.0
		Insoluble Chromium VI	1260	0.20u	992	127.1	100
BLANK10	05LVI078-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100.8	1.0
		Insoluble Chromium VI	1250	0.20u	1110	112.5	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/11/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J10FT0	% Solids	94.9	95.3	0.44	1.0
-004REP	J10FR9	Chromium VI	0.20u	0.20u	NC	1.0

Date: 12 January 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100F Area Burial Grounds Remaining Sites – Soil –Waste Sites 100-F-38 & 128-F-2
Subject: Inorganics - Data Package No. K0080

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0080 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J10FT0	11/2/05	Soil	C	See note 1 & 2
J10FT1	11/2/05	Soil	C	See note 1 & 2
J10FT2	11/2/05	Soil	C	See note 1 & 2
J10FR9	11/2/05	Soil	C	See note 1 & 3

1 – ICP metals (6010B) and mercury (7471A.
2 – Waste site 100-F-38.
3 – Waste site 128-F-2.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work, Sampling and Analysis Plan for the 100 Area Remaining Sites (DOE/RL-99-58, Rev. 0, September 2000) and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits (48.1%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (47.3%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. K0080 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to a matrix spike recovery outside QC limits (48.1%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (47.3%), all silicon results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

DOE/RL-99-58, Rev. 0, *Sampling and Analysis Plan for the 100 Area Remaining Sites*, September 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: KQ080	REVIEWER: TLH	Project: 100-F-38 128-F-2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD									
Lab: LLI	SDG: K0080								
Sample Number		J10FT0		J10FT1		J10FT2		J10FR9	
Waste site		100-F-38		100-F-38		100-F-38		128-F-2	
Remarks									
Sample Date		11/2/05		11/2/05		11/2/05		11/2/05	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.14	U	0.14	U	0.15	U	0.14	U
Aluminum		7770		4790		5850		4710	
Arsenic	10	2.4		1.8		2.4		2.0	
Boron		23.5		5.6		15.4		1.1	
Barium	2	388		105		237		60.8	
Beryllium		0.43		0.20		0.30		0.19	
Calcium		11000		4250		6840		4850	
Cadmium	0.2	0.1		0.07		0.12		0.11	
Cobalt		6.3		5.2		5.9		6.4	
Chromium	1	14.5		7.0		12.2		8.0	
Copper		18.0		11.8		14.8		10.2	
Iron		17900		12600		15200		17300	
Mercury	0.2	0.02	U	0.02	U	0.02	U	0.01	U
Potassium		1020		908		906		1010	
Magnesium		4900		3240		3990		4300	
Manganese		291		230		241		250	
Molybdenum		0.51		0.36		0.45		0.29	
Sodium		404		176		321		148	
Nickel		10.8		8.3		9.6		10.1	
Lead	5	38.4		4.5		29.6		3.0	
Antimony		0.41	UJ	0.41	UJ	0.41	UJ	0.40	UJ
Selenium	1	0.37	U	0.37	U	0.37	U	0.48	
Silicon		1230	J	864	J	824	J	764	J
Vanadium		44.1		29.8		38.9		40.6	
Zinc	1	36.4		29.5		34.3		34.3	

0100010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10FT0	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	7770	MG/KG	3.1	1.0
		Arsenic, Total	2.4	MG/KG	0.35	1.0
		Boron, Total	23.5	MG/KG	0.28	1.0
		Barium, Total	388	MG/KG	0.31	1.0
		Beryllium, Total	0.43	MG/KG	0.01	1.0
		Calcium, Total	11000	MG/KG	2.0	1.0
		Cadmium, Total	0.1	MG/KG	0.07	1.0
		Cobalt, Total	6.3	MG/KG	0.12	1.0
		Chromium, Total	14.5	MG/KG	0.16	1.0
		Copper, Total	18.0	MG/KG	0.30	1.0
		Iron, Total	17900	MG/KG	1.0	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1020	MG/KG	55.2	1.0
		Magnesium, Total	4900	MG/KG	3.5	1.0
		Manganese, Total	291	MG/KG	0.02	1.0
		Molybdenum, Total	0.51	MG/KG	0.13	1.0
		Sodium, Total	404	MG/KG	2.9	1.0
		Nickel, Total	10.8	MG/KG	0.13	1.0
		Lead, Total	38.4	MG/KG	0.32	1.0
		Antimony, Total	0.41 u J	MG/KG	0.41	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Silicon, Total	1230 J	MG/KG	0.84	1.0
		Vanadium, Total	44.1	MG/KG	0.09	1.0
		Zinc, Total	36.4	MG/KG	0.14	1.0

K 11/12/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J10FT1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	4790	MG/KG	3.1	1.0
		Arsenic, Total	1.8	MG/KG	0.35	1.0
		Boron, Total	5.6	MG/KG	0.28	1.0
		Barium, Total	105	MG/KG	0.31	1.0
		Beryllium, Total	0.20	MG/KG	0.01	1.0
		Calcium, Total	4250	MG/KG	2.0	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	5.2	MG/KG	0.12	1.0
		Chromium, Total	7.0	MG/KG	0.16	1.0
		Copper, Total	11.8	MG/KG	0.30	1.0
		Iron, Total	12600	MG/KG	1.0	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	908	MG/KG	55.2	1.0
		Magnesium, Total	3240	MG/KG	3.6	1.0
		Manganese, Total	230	MG/KG	0.02	1.0
		Molybdenum, Total	0.36	MG/KG	0.13	1.0
		Sodium, Total	176	MG/KG	2.9	1.0
		Nickel, Total	8.3	MG/KG	0.13	1.0
		Lead, Total	4.5	MG/KG	0.32	1.0
		Antimony, Total	0.41 u J	MG/KG	0.41	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Silicon, Total	864 J	MG/KG	0.84	1.0
		Vanadium, Total	29.8	MG/KG	0.09	1.0
		Zinc, Total	29.5	MG/KG	0.14	1.0

11/12/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J10FT2	Silver, Total	0.15 u	MG/KG	0.15	1.0
		Aluminum, Total	5850	MG/KG	3.2	1.0
		Arsenic, Total	2.4	MG/KG	0.35	1.0
		Boron, Total	15.4	MG/KG	0.28	1.0
		Barium, Total	237	MG/KG	0.31	1.0
		Beryllium, Total	0.30	MG/KG	0.01	1.0
		Calcium, Total	6840	MG/KG	2.0	1.0
		Cadmium, Total	0.12	MG/KG	0.07	1.0
		Cobalt, Total	5.9	MG/KG	0.12	1.0
		Chromium, Total	12.2	MG/KG	0.17	1.0
		Copper, Total	14.8	MG/KG	0.30	1.0
		Iron, Total	15200	MG/KG	1.0	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	906	MG/KG	55.9	1.0
		Magnesium, Total	3990	MG/KG	3.6	1.0
		Manganese, Total	241	MG/KG	0.02	1.0
		Molybdenum, Total	0.45	MG/KG	0.13	1.0
		Sodium, Total	321	MG/KG	2.9	1.0
		Nickel, Total	9.6	MG/KG	0.13	1.0
		Lead, Total	29.6	MG/KG	0.32	1.0
		Antimony, Total	0.41 u J	MG/KG	0.41	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Silicon, Total	824 J	MG/KG	0.85	1.0
		Vanadium, Total	38.9	MG/KG	0.09	1.0
		Zinc, Total	34.3	MG/KG	0.15	1.0

1/12/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J10FR9	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	4710	MG/KG	3.0	1.0
		Arsenic, Total	2.0	MG/KG	0.34	1.0
		Boron, Total	1.1	MG/KG	0.27	1.0
		Barium, Total	60.8	MG/KG	0.30	1.0
		Beryllium, Total	0.19	MG/KG	0.01	1.0
		Calcium, Total	4850	MG/KG	1.9	1.0
		Cadmium, Total	0.11	MG/KG	0.07	1.0
		Cobalt, Total	6.4	MG/KG	0.12	1.0
		Chromium, Total	8.0	MG/KG	0.16	1.0
		Copper, Total	10.2	MG/KG	0.29	1.0
		Iron, Total	17300	MG/KG	0.98	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1010	MG/KG	53.6	1.0
		Magnesium, Total	4300	MG/KG	3.4	1.0
		Manganese, Total	250	MG/KG	0.02	1.0
		Molybdenum, Total	0.29	MG/KG	0.13	1.0
		Sodium, Total	148	MG/KG	2.8	1.0
		Nickel, Total	10.1	MG/KG	0.13	1.0
		Lead, Total	3.0	MG/KG	0.31	1.0
		Antimony, Total	0.40 uJ	MG/KG	0.40	1.0
		Selenium, Total	0.48	MG/KG	0.36	1.0
		Silicon, Total	764 J	MG/KG	0.82	1.0
		Vanadium, Total	40.6	MG/KG	0.09	1.0
		Zinc, Total	34.3	MG/KG	0.14	1.0

11/12/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-031
LVL#: 0511L633
SDG/SAF#: K0080/RC-031

W.O.#: 11343-606-001-9999-00
Date Received: 11-04-05

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were rerun for Aluminum, Barium, Calcium, Copper, Iron, Potassium, Magnesium, Sodium, and Zinc due to high concentrations and sample matrix.

3. All analyses were performed within the required holding times.

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 47.3%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

10. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 22 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J10FT0	Aluminum	40,000	98.7
	Calcium	40,000	85.0
	Iron	40,000	80.2
	Antimony	100	89.9

12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

14. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

15. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

11/17/03
Date

jjw/m11-633

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-031-008	Page 1 of 1
Collector: COFFMAN	Company Contact: R T Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround
Project Designation: 100-F Burial Grounds Remaining Sites - Soil Quick Turn	Sampling Location: 100 F / 100-F-38		SAF No.: RC-031	Air Quality ☐ 15 DAY
Ice Chest No.: ERC-01-040	Field Logbook No.: EFL-1174	COA: R126F22000	Method of Shipment: FED X	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: AD60104		Bill of Lading/Air Bill No.: see OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

Special Handling and/or Storage
Cool 4 deg. C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	P				
No. of Container(s)	1	1	1	1	1	1				
Volume	60mL	60mL	60mL	60mL	60mL	1000mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Antimony, Beryllium, Nickel, Thallium)	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions. PAS 11/3/05				
Sample No.	Matrix *	Sample Date	Sample Time							
J10FT0	SOIL	11/2/05	1230	X	X	X	X	X	X	CENTER
J10FT1	SOIL	11/2/05	1245	X	X	X	X	X	X	SOUTH
J10FT2	SOIL	11/2/05	1300	X	X	X	X	X	X	NORTH

0000018

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT COFFMAN / RT Coffman	1600 11/2/05	REFER #2A 3728	1600 11/2/05
3725 Ref 24	11/3/05 1000	[illegible]	11/3/05 1000
[illegible]	11/3/05 1000	FED EX	
FED EX	11-4-05 1030	[illegible]	11-4-05 1030

SPECIAL INSTRUCTIONS
NA

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Uranium-235, Uranium-238}

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquid
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-031-007	Page 1 of 1

Collector: COFFMAN	Company Contact: R T Coffman; Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code; Data Turnaround
Project Designation: 100-F Burial Grounds Remaining Sites - Soil Quick Turn	Sampling Location: 100 F / 126-F-2, Light sandy ash material	SAF No.: RC-031	Air Quality ☐; 15 DAYS
Ice Chest No.: ERC-01-040	Field Logbook No.: EFL-1174; COA: R126F22000	Method of Shipment: FED X	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060104	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE ~~HAZARDS/~~REMARKS
NA

Special Handling and/or Storage
Cool 4 deg. C

Preservation	None	None	Cool 4C	None
Type of Container	aG	aG	aG	P
No. of Container(s)	1	1	1	1
Volume	60mL	60mL	60mL	1000mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Antimony, Beryllium, Nickel, Thallium)	Chromium Hex - 7196	See item (2) in Special Instructions. DAS 11/3/05

Sample No.	Matrix *	Sample Date	Sample Time				
J10FR9	SOIL	11/2/05	1200	X	X	X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT COFFMAN / RT Coffman	11/2/05 1600	REFER #2A, 3728	11/2/05 1600
3728 REF 2A	11/3/05 1000	D St John [signature]	11/3/05 1000
D St John [signature]	11/3/05 1000	Fed Ex	
[signature]	11.4.05/0920	[signature]	11.4.05/0920

SPECIAL INSTRUCTIONS
NA

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Uranium-235, Uranium-238}

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

000019

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-38 128-F-2			DATA PACKAGE: K0080		
VALIDATOR:		LAB: LLI		DATE: 1/9/06	
			SDG: K0086		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J10FT0 J10FT1 J10FT2 J10FR9					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

ICP interference checks acceptable? ..... Yes No (N/A)

ICV and CCV checks performed on all instruments? ..... Yes No (N/A)

ICV and CCV checks acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No (N/A)
ICB and CCB results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: _____

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... Yes (No) N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... Yes (No) N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: antimony - MS - J
Silver - LCS - J

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	(Yes)	No	N/A
Duplicate results acceptable?	(Yes)	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	(N/A)
MS/MSD standards expired? (Levels D, E)	Yes	No	(N/A)
Field duplicate RPD values acceptable?	Yes	No	(N/A)
Field split RPD values acceptable?	Yes	No	(N/A)
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments:_____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	Yes	No	(N/A)
ICP serial dilution %D values acceptable?	Yes	No	(N/A)
ICP post digestion spike required?	Yes	No	(N/A)
ICP post digestion spike values acceptable?	Yes	No	(N/A)
Standards traceable?	Yes	No	(N/A)
Standards expired?	Yes	No	(N/A)
Transcription/calculation errors?	Yes	No	(N/A)

Comments:_____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:_____

8. HOLDING TIMES (all levels)

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments:_____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Rresults supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	05L0648-MB1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	3.0 u	MG/KG	3.0	1.0
		Arsenic, Total	0.34 u	MG/KG	0.34	1.0
		Boron, Total	0.27 u	MG/KG	0.27	1.0
		Barium, Total	0.30 u	MG/KG	0.30	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	2.0	MG/KG	2.0	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.12 u	MG/KG	0.12	1.0
		Chromium, Total	0.16 u	MG/KG	0.16	1.0
		Copper, Total	0.29 u	MG/KG	0.29	1.0
		Iron, Total	1.0	MG/KG	0.99	1.0
		Potassium, Total	81.7	MG/KG	54.0	1.0
		Magnesium, Total	3.5 u	MG/KG	3.5	1.0
		Manganese, Total	0.02 u	MG/KG	0.02	1.0
		Molybdenum, Total	0.13 u	MG/KG	0.13	1.0
		Sodium, Total	3.7	MG/KG	2.8	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.31 u	MG/KG	0.31	1.0
		Antimony, Total	0.40 u	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	4.9	MG/KG	0.82	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.14 u	MG/KG	0.14	1.0
BLANK1	05C0265-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J10FT0	Silver, Total	4.6	0.14u	5.2	88.5	1.0
		Aluminum, Total	8910	7770	207	553.9*	1.0
		Arsenic, Total	183	2.4	207	87.5	1.0
		Boron, Total	113	23.5	103	86.8	1.0
		Barium, Total	590	388	207	97.7	1.0
		Beryllium, Total	5.2	0.43	5.2	91.7	1.0
		Calcium, Total	12200	11000	2580	46.3*	1.0
		Cadmium, Total	4.7	0.1	5.2	88.5	1.0
		Cobalt, Total	53.4	6.3	51.6	91.3	1.0
		Chromium, Total	34.5	14.5	20.7	96.6	1.0
		Copper, Total	44.2	18.0	25.8	101.6	1.0
		Iron, Total	17500	17900	103	-360. *	1.0
		Mercury, Total	0.18	0.02u	0.16	113.5	1.0
		Potassium, Total	3530	1020	2580	97.2	1.0
		Magnesium, Total	7590	4900	2580	104.0	1.0
		Manganese, Total	343	291	51.6	100.6*	1.0
		Molybdenum, Total	93.3	0.51	103	89.8	1.0
		Sodium, Total	2980	404	2580	99.6	1.0
		Nickel, Total	58.2	10.8	51.6	91.9	1.0
		Lead, Total	86.7	38.4	51.6	93.6	1.0
		Antimony, Total	24.8	0.41u	51.6	48.1	1.0
		Selenium, Total	177	0.37u	207	85.5	1.0
		Silicon, Total	1350	1230	103	114.1*	1.0
		Vanadium, Total	93.6	44.1	51.6	95.9	1.0
		Zinc, Total	85.5	36.4	51.6	95.2	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J10FT0	Silver, Total	0.14u	0.14u	NC	1.0
		Aluminum, Total	7770	7180	7.9	1.0
		Arsenic, Total	2.4	2.4	0.00	1.0
		Boron, Total	23.5	21.5	8.9	1.0
		Barium, Total	388	351	9.9	1.0
		Beryllium, Total	0.43	0.43	0.95	1.0
		Calcium, Total	11000	8720	23.3	1.0
		Cadmium, Total	0.1	0.10	5.1	1.0
		Cobalt, Total	6.3	6.5	3.1	1.0
		Chromium, Total	14.5	13.2	9.4	1.0
		Copper, Total	18.0	17.2	4.5	1.0
		Iron, Total	17900	16100	10.5	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Potassium, Total	1020	983	3.6	1.0
		Magnesium, Total	4900	4580	6.9	1.0
		Manganese, Total	291	250	15.0	1.0
		Molybdenum, Total	0.51	0.44	15.6	1.0
		Sodium, Total	404	424	4.8	1.0
		Nickel, Total	10.8	11.5	6.3	1.0
		Lead, Total	38.4	35.4	8.1	1.0
		Antimony, Total	0.41u	0.41u	NC	1.0
		Selenium, Total	0.37u	0.37u	NC	1.0
		Silicon, Total	1230	997	21.0	1.0
		Vanadium, Total	44.1	40.9	7.5	1.0
		Zinc, Total	36.4	35.5	2.5	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 LVL LOT #: 0511L633

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	05L0648-LC1	Silver, LCS	47.6	50.0	MG/KG	95.2
		Aluminum, LCS	480	500	MG/KG	96.1
		Arsenic, LCS	916	1000	MG/KG	91.6
		Boron, LCS	465	500	MG/KG	92.9
		Barium, LCS	500	500	MG/KG	100
		Beryllium, LCS	23.8	25.0	MG/KG	95.2
		Calcium, LCS	2310	2500	MG/KG	92.6
		Cadmium, LCS	23.7	25.0	MG/KG	94.8
		Cobalt, LCS	241	250	MG/KG	96.3
		Chromium, LCS	48.4	50.0	MG/KG	96.8
		Copper, LCS	120	125	MG/KG	96.3
		Iron, LCS	473	500	MG/KG	94.5
		Potassium, LCS	2430	2500	MG/KG	97.4
		Magnesium, LCS	2320	2500	MG/KG	92.7
		Manganese, LCS	72.3	75.0	MG/KG	96.4
		Molybdenum, LCS	480	500	MG/KG	95.9
		Sodium, LCS	2390	2500	MG/KG	95.7
		Nickel, LCS	190	200	MG/KG	94.8
		Lead, LCS	235	250	MG/KG	93.8
		Antimony, LCS	276	300	MG/KG	92.1
		Selenium, LCS	895	1000	MG/KG	89.5
		Silicon, LCS	237	500	MG/KG	47.3
		Vanadium, LCS	241	250	MG/KG	96.2
		Zinc, LCS	91.7	100	MG/KG	91.7
LCS1	05C0265-LC1	Mercury, LCS	6.4	2.9	MG/KG	~~220.3~~ 102.9

MW 11/17/05

Date: 12 January 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100F Area Burial Grounds Remaining Sites – Soil –Waste Sites 100-F-38 & 128-F-2
Subject: Radiochemistry - Data Package No. K0080

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0080 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J10FT0	11/2/05	Soil	C	See note 1 & 2
J10FT1	11/2/05	Soil	C	See note 1 & 2
J10FT2	11/2/05	Soil	C	See note 1 & 2
J10FR9	11/2/05	Soil	C	See note 1 & 3

1 – Gamma spectroscopy.
2 – Waste site 100-F-38.
3 – Waste site 128-F-2.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work, Sampling and Analysis Plan for the 100 Area Remaining Sites (DOE/RL-99-58, Rev. 0, September 2000) and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

· **Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

· **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 80-120%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

All accuracy results were acceptable.

· **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 30%, no qualification is required. If

either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD outside QC limits (32%), all thorium-228 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicates

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste site RQLs to ensure that laboratory detection levels meet the required criteria. Eight analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0080 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an RPD outside QC limits (32%), all thorium-228 results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Eight analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

DOE/RL-99-58, Rev. 0, *Sampling and Analysis Plan for the 100 Area Remaining Sites*, September 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0080	REVIEWER: TL	Project: 100-F-38 128-F-2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-228	J	All	RPD

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD										
Laboratory: EB	SDG: K0080									
Sample Number		J10FT0		J10FT1		J10FT2			J10FR9	
Waste Site		100-F-38		100-F-38		100-F-38			128-F-2	
Remarks										
Sample Date		11/2/05		11/2/05		11/2/05			11/2/05	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	RQL	Result	Q
Potassium-40		11.9		12.6		23.8			13.5	
Cobalt 60	0.05	U	U	U	U	U	U	0.05	U	U
Cesium 137	0.05	U	U	U	U	U	U	0.1	U	U
Radium-226		0.520		0.546		0.957			0.535	
Radium-228		0.687		0.739		1.36			0.772	
Europium 152	0.1	U	U	U	U	U	U*		U	U
Europium 154	0.1	U	U*	U	U*	U	U*	0.1	U	U*
Europium 155	0.1	U	U*	U	U	U	U*	0.1	U	U*
Thorium-228		0.802	J	0.576	J	1.27	J		0.785	J
Thorium-232		0.687		0.739		1.36			0.772	
Uranium-235(gea)		U	U	U	U	U	U		U	U
Uranium-238(gea)		U	U	U	U	U	U		U	U
Americium-241(gea)		U	U	U	U	U	U		U	U

000010

* - RQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0080

7768-002 J10FT0

DATA SHEET

SDG	7768	Client/Case no	Hanford	SDG K0080	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R511059-02	Client sample id	J10FT0		
Dept sample id	7768-002	Location/Matrix	100 F/100-F-38	SOLID	
Received	11/04/05	Collected/Weight	11/02/05 12:30	1554 g	
% solids	95.8	Custody/SAF No	RC-031-008	RC-031	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	11.9	1.0	0.28			GAM
Cobalt 60	10198-40-0	U		0.044	0.050	U	GAM
Cesium 137	10045-97-3	U		0.039	0.10	U	GAM
Radium 226	13982-63-3	0.520	0.074	0.070	0.10		GAM
Radium 228	15262-20-1	0.687	0.15	0.16	0.20		GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	U		0.15	0.10	U	GAM
Europium 155	14391-16-3	U		0.084	0.10	U	GAM
Thorium 228	14274-82-9	0.802	0.058	0.053		J	GAM
Thorium 232	TH-232	0.687	0.15	0.16			GAM
Uranium 235	15117-96-1	U		0.13		U	GAM
Uranium 238	U-238	U		4.8		U	GAM
Americium 241	14596-10-2	U		0.055		U	GAM

100F BurialGrnds.Remaim.Sites-SoilQT

11/12/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/01/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0080

7768-004 J10FT2

DATA SHEET

SDG	7768	Client/Case no	Hanford	SDG K0080	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R511059-04	Client sample id	J10FT2		
Dept sample id	7768-004	Location/Matrix	100 F/100-F-38	SOLID	
Received	11/04/05	Collected/Weight	11/02/05 13:00	1605 g	
% solids	95.7	Custody/SAF No	RC-031-008	RC-031	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	23.8	1.4	0.39			GAM
Cobalt 60	10198-40-0	U		0.046	0.050	U	GAM
Cesium 137	10045-97-3	U		0.042	0.10	U	GAM
Radium 226	13982-63-3	0.957	0.094	0.080	0.10		GAM
Radium 228	15262-20-1	1.36	0.17	0.15	0.20		GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.14	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	1.27	0.062	0.058		J	GAM
Thorium 232	TH-232	1.36	0.17	0.15			GAM
Uranium 235	15117-96-1	U		0.20		U	GAM
Uranium 238	U-238	U		5.2		U	GAM
Americium 241	14596-10-2	U		0.41		U	GAM

100F BurialGrnds.Remaim.Sites-SoilQT

11/26/05

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/01/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0080

7768-003 J10FT1

DATA SHEET

SDG	7768	Client/Case no	Hanford SDG K0080
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R511059-03	Client sample id	J10FT1
Dept sample id	7768-003	Location/Matrix	100 F/100-F-38 SOLID
Received	11/04/05	Collected/Weight	11/02/05 12:45 1682 g
% solids	95.5	Custody/SAF No	RC-031-008 RC-031

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Potassium 40	13966-00-2	12.6	0.72	0.31			GAM
Cobalt 60	10198-40-0	U		0.037	0.050	U	GAM
Cesium 137	10045-97-3	U		0.030	0.10	U	GAM
Radium 226	13982-63-3	0.546	0.060	0.053	0.10		GAM
Radium 228	15262-20-1	0.739	0.17	0.16	0.20		GAM
Europium 152	14683-23-9	U		0.082	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	0.576	0.036	0.035		J	GAM
Thorium 232	TH-232	0.739	0.17	0.16			GAM
Uranium 235	15117-96-1	U		0.15		U	GAM
Uranium 238	U-238	U		3.7		U	GAM
Americium 241	14596-10-2	U		0.27		U	GAM

100F BurialGrnds.Remaim.Sites-SoilQT

11/12/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/01/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0080

7768-001 J10FR9

DATA SHEET

SDG	7768	Client/Case no	Hanford SDG K0080
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R511059-01	Client sample id	J10FR9
Dept sample id	7768-001	Location/Matrix	100F/126F2 LightSandyAsh SOLID
Received	11/04/05	Collected/Weight	11/02/05 12:00 1454 g
% solids	98.5	Custody/SAF No	RC-031-007 RC-031

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	13.5	0.80	0.32			GAM
Cobalt 60	10198-40-0	U		0.036	0.050	U	GAM
Cesium 137	10045-97-3	U		0.032	0.10	U	GAM
Radium 226	13982-63-3	0.535	0.082	0.072	0.10		GAM
Radium 228	15262-20-1	0.772	0.17	0.16	0.20		GAM
Europium 152	14683-23-9	U		0.088	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Thorium 228	14274-82-9	0.785	0.066	0.066		J	GAM
Thorium 232	TH-232	0.772	0.17	0.16			GAM
Uranium 235	15117-96-1	U		0.16		U	GAM
Uranium 238	U-238	U		4.2		U	GAM
Americium 241	14596-10-2	U		0.29		U	GAM

100F BurialGrnds.Remaim.Sites-SoilQT

11/12/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/01/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0080 was composed of four solid (soil) samples designated under SAF No. RC-031 with a Project Designation of: 100-F Burial Grounds Remaining Sites – Soil Quick Turn.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on December 1, 2005.

2.0 ANALYSIS NOTES

2.1 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa C. Mannion
Senior Program Manager

12/7/5
Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-031-008	Page 1 of 1

Collector: COFFMAN	Company Contact: R T Coffman; Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code; Data Turnaround
Project Designation: 100-F Burial Grounds Remaining Sites - Soil Quick Turn	Sampling Location: 100 F / 100-F-38 K008D (T768)	SAF No.: RC-031	Air Quality ☐ 15 DAY
Ice Chest No.: ERC-02 003	Field Logbook No.: EFL-1174; COA: R126F22000	Method of Shipment: FED X	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060086	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 deg. C

0000017

SAMPLE ANALYSIS											
Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	P				
No. of Container(s)	1	1	1	1	1	1				
Volume	60mL	60mL	60mL	60mL	60mL	1000mL				
Analysis	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) {Antimony, Beryllium, Nickel, Thallium}	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.				

Sample No.	Matrix *	Sample Date	Sample Time										
J10FT0	SOIL	11/2/05	1230	X	X	X	X	X	X			CENTER	
J10FT1	SOIL	11/2/05	1245	X	X	X	X	X	X			SOUTH	
J10FT2	SOIL	11/2/05	1300	X	X	X	X	X	X			NORTH	

DAS

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT COFFMAN / RT Coffman	11/2/05 1600	REFER #2A 3728	11/2/05 1600
3728 Ref 2A	11/3/05 1000	D Stock Pund [illegible]	11/3/05 1000
D Stock Pund [illegible]	11/3/05 1000	Fed Ex	
FED EX	11/04/05	[illegible]	11/04/05 9:30

SPECIAL INSTRUCTIONS

NA

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Uranium-235, Uranium-238}

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-031-007	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code / Data Turnaround
COFFMAN	R T Coffman 528-6409	KESSNER, JH	Air Quality ☐ 15 DAYS

Project Designation	Sampling Location	SAF No.
100-F Burial Grounds Remaining Sites - Soil Quick Turn	100 F / 126-F-2, Light sandy ash material K0080 (7768)	RC-031

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-02-003	EFL-1174	R126F22000	FED X

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A060086	see 05c

~~POSSIBLE SAMPLE~~ HAZARDS/REMARKS
NA

Special Handling and/or Storage
Cool 4 deg. C

000018

Preservation	None	None	Cool 4C	None							
Type of Container	aG	aG	aG	P							
No. of Container(s)	1	1	1	1							
Volume	60mL	60mL	60mL	1000mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Antimony, Beryllium, Nickel, Thallium)	Chromium Hex - 7196	See item (2) in Special Instructions.							
Sample No. / Matrix * / Sample Date / Sample Time											
J10FR9 / SOIL / 11/2/05 / 1200	X	X	X	X							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R T Coffman/RT Coffman	11/2/05 1600	KEFR #2A, 3728	11/2/05 1600
3728 Ref 2A	11/3/05 1000	Burial Sq	11/3/05 1000
Burial Sq	11/3/05 1000	Fed Ex	
Fed Ex	11/04/05	[illegible]	11/04/05 9:20

SPECIAL INSTRUCTIONS
NA

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Uranium-235, Uranium-238}

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 100F38 + 128-F-2			DATA PACKAGE: K0080		
VALIDATOR: TLI		LAB: EB		DATE: 1/9/06	
			SDG: K0080		

ANALYSES PERFORMED					
Gross Alpha/Beta Total Uranium	Strontium-90 Radium-22	Technetium-99 Tritium	Alpha Spectroscopy	Gamma Spectroscopy	

SAMPLES/MATRIX
J10FR9 J10FT0 J10FT1 J10FT2
Soil

1. Completeness ..... ☐ N/A

Technical verification forms present? ..... Yes (No) N/A

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E) ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A
Method blank results acceptable? ..... Yes No N/A
Analytes detected in method blank? ..... Yes No N/A
Field blank(s) analyzed? ..... Yes No N/A
Field blank results acceptable? ..... Yes No N/A
Analytes detected in field blank(s)? ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A
Comments: no FB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... Yes No N/A
LCS/BSS recoveries acceptable? ..... Yes No N/A
LCS/BSS traceable? (Levels D,E) ..... Yes No N/A
LCS/BSS expired? (Levels D,E) ..... Yes No N/A
LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A
Comments:

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☒ N/A

Chemical carrier added? ..... Yes No N/A
Chemical recovery acceptable? ..... Yes No N/A
Chemical carrier traceable? (Levels D, E) ..... Yes No N/A

Chemical carrier expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

8. Tracer Recovery (Levels C, D, E) ..... ☒ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E) ..... Yes No N/A

Tracer expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

9. Matrix Spikes (Levels C, D, E) ..... ☒ N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

10. Duplicates (Levels C, D, E) ☐ N/A

Duplicates Analyzed at required frequency? (Yes) No N/A

RPD Values Acceptable? Yes (No) N/A

Transcription/Calculation Errors? (Levels D, E) Yes No (N/A)

Comments: Th 228 3270 – J all

11. Field QC Samples (Levels C, D E) ☐ N/A

Field duplicate sample(s) analyzed? Yes (No) N/A

Field duplicate RPD values acceptable? Yes No (N/A)

Field split sample(s) analyzed? Yes (No) N/A

Field split RPD values acceptable? Yes No (N/A)

Performance audit sample(s) analyzed? Yes (No) N/A

Performance audit sample results acceptable? Yes No (N/A)

Comments: No FD, FS or PA

12. Holding Times (All levels)

Are sample holding times acceptable? (Yes) No N/A

Comments:

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses?	Yes	No	N/A
Results supported in raw data?(Levels D, E)	Yes	No	N/A
Results Acceptable? (Levels D, E)	Yes	No	N/A
Transcription/Calculation errors? (Levels D, E)	Yes	No	N/A
MDA's meet required detection limits?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments: See cover

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0080

7768-006 **Method Blank**

METHOD BLANK

SDG 7768	Client/Case no Hanford	SDG K0080	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R511059-06	Client sample id Method Blank		
Dept sample id 7768-006	Material/Matrix	SOLID	
	SAF No RC-031		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Potassium 40	13966-00-2	U		0.17		U	GAM
Cobalt 60	10198-40-0	U		0.018	0.050	U	GAM
Cesium 137	10045-97-3	U		0.014	0.10	U	GAM
Radium 226	13982-63-3	U		0.032	0.10	U	GAM
Radium 228	15262-20-1	U		0.057	0.20	U	GAM
Europium 152	14683-23-9	U		0.034	0.10	U	GAM
Europium 154	15585-10-1	U		0.041	0.10	U	GAM
Europium 155	14391-16-3	U		0.025	0.10	U	GAM
Thorium 228	14274-82-9	U		0.016		U	GAM
Thorium 232	TH-232	U		0.057		U	GAM
Uranium 235	15117-96-1	U		0.041		U	GAM
Uranium 238	U-238	U		1.8		U	GAM
Americium 241	14596-10-2	U		0.015		U	GAM

100F BurialGrnds.Remaim.Sites-SoilQT

QC-BLANK #54936

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0080

7768-005

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7768 | Client/Case no Hanford | SDG K0080

Contact Melissa C. Mannion | Contract No. 630

Lab sample id R511059-05 | Client sample id Lab Control Sample

Dept sample id 7768-005 | Material/Matrix SOLID

SAF No RC-031

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Cobalt 60	0.643	0.064	0.036	0.050		GAM	0.637	0.025	101	72-128	80-120
Cesium 137	0.700	0.054	0.037	0.10		GAM	0.653	0.026	107	72-128	80-120

100F BurialGrnds.Remaim.Sites-SoilQT

QC-LCS #54935

LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

Page 8

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 12/01/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0080

7768-007 J10FT1

DUPLICATE

SDG	7768			Client/Case no	Hanford SDG K0080
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R511059-07	Lab sample id	R511059-03	Client sample id	J10FT1
Dept sample id	7768-007	Dept sample id	7768-003	Location/Matrix	100 F/100-F-38 SOLID
		Received	11/04/05	Collected/Weight	11/02/05 12:45 1682 g
% solids	95.5	% solids	95.5	Custody/SAF No	RC-031-008 RC-031

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Potassium 40	12.6	0.75	0.33			GAM	12.6	0.72	0.31		0	34	0
Cobalt 60	U		0.035	0.050	U	GAM	U		0.037	U	-		0.1
Cesium 137	U		0.031	0.10	U	GAM	U		0.030	U	-		0
Radium 226	0.465	0.060	0.058	0.10		GAM	0.546	0.060	0.053		16	41	1.2
Radium 228	0.649	0.14	0.14	0.20		GAM	0.739	0.17	0.16		13	57	0.7
Europium 152	U		0.082	0.10	U	GAM	U		0.082	U	-		0
Europium 154	U		0.11	0.10	U	GAM	U		0.11	U	-		0
Europium 155	U		0.11	0.10	U	GAM	U		0.10	U	-		0.1
Thorium 228	0.798	0.067	0.065			GAM	0.576	0.036	0.035		32	36	2.7
Thorium 232	0.649	0.14	0.14			GAM	0.739	0.17	0.16		13	57	0.7
Uranium 235	U		0.15		U	GAM	U		0.15	U	-		0
Uranium 238	U		4.2		U	GAM	U		3.7	U	-		0.2
Americium 241	U		0.28		U	GAM	U		0.27	U	-		0.1

100F BurialGrnds.Remaim.Sites-SoilQT

QC-DUP#3 54937

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 12/01/05